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Research article

INCIDENCE OF *HENOSEPILACHNA VIGINTIOCTOPUNCTATA* FAB. ON BRINJAL IN EASTERN UTTAR PRADESH

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ABSTRACT: Field trial was conducted to study the seasonal incidence and influence of abiotic and biotic factors on *Henosepilachna vigintioctopunctata* of brinjal during 2011-12.The incidence of *H.vigintioctopunctata* started during first week after transplanting with a mean population of 0.81 per planton brinjal crop. The peak incidence was observed during the third week of October with a mean population of 6.98 per plant and the incidence decreased gradually up to crop maturity. Data recorded on effect of abiotic and biotic factors on *H.vigintioctopunctata* population revealed that the incidence had non-significant relation with a biotic factors like minimum temperature, evening relative humidity and significant relationship with maximum temperature, morning relative humidity and rainfall. The pest population also shows positive and significant correlation with biotic factors like coccinellid beetles as well as spiders.

Keywords: *Henosepilachnavigintioctopunctata*, seasonal incidence, brinjal

INTRODUCTION

Brinjal (*Solanummelongena*L.) also known as egg plant. It occupies a distinct place in the realm of vegetable crops being most popular and important vegetable crops grown in India and many parts of the world. It is native of Indian sub-continent, with India as the probable centre of origin (Gleddie*et al.*, 1986).A variety of white brinjal is said to be good for diabetic patients for its medicinal properties.It is popularly known as common man's vegetable. Among various constraints in the higher production of brinjal, it is infested by a large number of insect pests including shoot and fruit borer (*L. orbonalis*), epilachna beetle (*H.vigintioctopunctata*), leaf hopper (*A. devastans*) and whitefly (*B. tabaci*), resulting in about 70 - 92 per cent loss in yield of brinjal (Rosaiah, 2001). Extensive use of second generation conventional insecticides to control the pests led to the development of resistance and resurgence in the target species and ecological disturbances. Now a days it is necessary to gain thorough knowledge of seasonal activity of different pests as well as natural enemies helps in developing efficient pest management strategies in a particular set of climatic conditions. Hence this study was under taken. Study on the seasonal incidence of *H.vigintioctopunctata* throughout the crop period in relation to abiotic and biotic factors gives basic information on population dynamics of *H.vigintioctopunctata* of brinjal. Hence this study was under taken.

MATERIALS AND METHODS

The experiment was carried out under field conditions at the Vegetable research Farm, Institute of Agricultural Sciences, BHU, Varanasi, on brinjal variety Punjab Barsati during 2011-12. For showing the seed, nursery bed was prepared to finetilth and raised about 15 cm height with 1 m width and consentient length. Seeds were shown on first week of august about 5 cm apart in lines and covered with fine soil and water immediately. For seasonal incidence study, the transplantation of seedlings was done in the first week of September. Seedlings of one month old were transplanted at two seedlings per hill in a bulk plot of 100m to by adopting 75 cm X 50 cm spacing. All recommended agronomical practices were followed from time to time to raise the crop successfully.

The pest population was recorded in the field of brinjal at 7 days interval from the occurrence or initiation of the pest infestation was continued up to maturity. A total 25 plants from five and omlo cations in the bulk plot at plants per each location were selected and location were selected and tagged for recording the observation *H.Vigintioctopunctata* and also their natural enemies like Coccinellid predatory beetles and spiders. The *H.Vigintioctopunctata* population of both grubs and adults were counted 25 selected and tagged plants. We at the data were recorded simultaneously from the Meteorological Observatory available at Agricultural farm, I.Ag.Sc, BHU, Varanasi and correlated with the occurrence of the pests of Brinjal. Among we at the parameters, maximum temperature, minimum temperature, relative humidity and rain fall were considered or correlating with the occurrence of the insect pest of Brinjal.

RESULTS AND DISCUSSION

Seasonal incidence of *H. vigintioctopunctata* in relation to weather parameters and natural enemies

The data recorded on the incidence of *H. vigintioctopunctata* grubs and adults revealed that its population was observed from 3.09.2011 to 08.01.2012. The initial incidence was again observed on 10.09.2011 i.e., at 7 days after transplantation with a mean population of 0.81 per plant. The weather parameters like maximum and minimum temperatures and relative humidity prevailing on this day of observation were recorded. The natural enemies like coccinellids and spiders were not observed during this period. The pest population reached to a peak by October 15th, 2011 with mean of 6.98 per plant. The average maximum and minimum temperatures are 31.7° and 20.4˚C respectively and average morning and evening relative humidity was 84 and 38 per cent respectively. The population of coccinellids and spiders were recorded to be 1.93 and 1.22 per plant respectively. These results are in accordance with Ghosh and Senapathi (2002) who reported that the population of *H. vigintiotopunctata* was found active from April to middle of October and the highest population was reported during middle of September. Muthukumar and Kalyana sundaram (2003) also reported that *H. vigintioctopunctata* damaged brinjal from first week after transplantation. Its incidence peaked from 7 to 9 weeks after transplantation.There after the pest population has declined gradually and reached to zero observed on 03.12.2012 with average maximum and minimum temperature prevailed were 26.8 and 14˚C respectively and relative humidity was 94 and 49 per cent respectively.

Table1: Influence of abiotic and biotic factors on seasonal incidence of *H. vigintioctopunctata* on brinjal (2011-12)

Week of observation	Temperature		Relative humidity		Rainfall	Natural enemies		*H. vigintioctopunctata*
	Max Temp. (˚C)	Min Temp. (˚C)	Morning RH (%)	Evening RH (%)	mm	Coccinellids Per plant	Spiders per plant	Mean population Per plant
Sep3-9	33.2	27	84	71	24.40	0	0	0
Sep10-16	31.8	25.4	92	77	56	0	0	0.81
Sep17-23	31.0	25.3	87	74	150.20	0	0	1.62
Sep24-30	32.7	24	81	56	31.80	0.12	0.10	2.43
Oct1-7	32.6	24.2	80	57	0	0.18	0.62	3.61
Oct8-14	32.7	22.2	79	51	0	0.96	0.94	5.28
Oct15-21	31.2	24.2	89	66	0	1.24	1.12	6.98
Oct22-28	31.1	19.4	79	44	17.21	1.48	1.42	4.84
Oct29-Nov04	28.4	16.8	82	47	0	2.4	0.96	3.14
Nov5-11	30.7	19.3	82	46	0	2.21	0.82	2.81
Nov12-18	30.1	18.4	85	44	0	2.0	0.56	2.02
Nov19-25	28.0	16.5	80	40	0.6	1.62	0.24	1.28
Nov26-Dec2	25.3	15.7	81	31	5.60	0.98	0.18	0.21
Dec3-9	24.9	12.1	86	36	0	0.62	0.12	0
Dec10-16	23.7	11.0	83	38	0	0.44	0	0
Dec17-23	23	7.9	79	31	305	0.14	0	0
Dec24-31	24.7	9.4	84	35	0	0	0	0
Jan1-7	14.2	7.2	89	56	0	0	0	0
Jan8-14	17.5	4.8	94	50	0	0	0	0

Correlations were also worked to find out the relationship between *H. vigintioctopunctata* population and the major weather parameters and natural enemies. The results indicated a positive and significant (r = 0.644) and positive and non-significant association (r = 0.416) between the maximum temperature and minimum temperature respectively. The association was negative and significant (r = -0.804) with morning relative humidiy and the relationship between the *H. vigintioctopunctata* population with the evening relative humidity (r = -0.387) and rain fall (r = -0.533) was negative and non-significant. The relationship between *H. vigintioctopunctata* population was positive and significant with coccinellid predators (r = 0.512) as well as spiders (r = 0.553). These results were in agreement with Raghuraman and Veeravel (1999) who reported positive with temperature and negative correlation with rainfall. The results of the present study also agree with the findings of Muthu Kumar and Kalyana sundaram (2003) who reported positive correlation between *H. vigintioctopunctata* and the average temperature. The data on incidence of *H. vigintioctopunctata* beetles when subjected to multiple linear regression analysis, the following equation was arrived-

$Y= 33.0127 + 0.2907X_1 + 0.2562X_2 - 0.3085X_3 - 0.0357X_4 + 0.0105X_5 - 0.2542X_6 + 2.8664X_7$.

Table2: Correlation coefficient of *H. vigintioctopunctata* population with abiotic and biotic factors

Variable *H. vigintioctopunctata*	2011-12
X_1-maximumtemperature	0.644
X_2-minimumtemperature	0.416 NS
X_3-morningrelativehumidity	-0.804
X_4-eveningrelativehumidity	-0.387 NS
X_5-rainfall	0.533
X_6-coccinillids	0.512
X_7-spiders	0.553

NS – Nonsignificant

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